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Method for affixing reusable fasteners on baby diapers

Specification:

The invention relates to a method for affixing a reusable fastener that consists of a fastener tape and a fastener strip to a baby diaper, whereby strips that consist of a carrier and a material laminated on, having fastener elements in the form of loops or hooks, are attached to the baby diaper without adhesive.

The material of the fastener band, i.e. fastener strip that can be laminated on can be produced by means of textile technology. The loops or hooks, which are produced by means of warp-knitting, for example, interact in the manner of a hook-and-loop system, whereby hook-shaped fastener elements of the one textile material engage into loops of the other textile material. The carrier of the fastener band and/or fastener strip can consist of a single-layer or multi-layer film, a textile material, or a laminate of a carrier film and a textile material laminated onto one side or both sides. Furthermore, the carrier can have a region having differing elasticity in the longitudinal direction of the strip. However, it is practical if at least the connection regions of the carrier, at which the bond with the baby diaper is produced, are configured as low-stretch regions. Polyolefins are particularly

suitable as materials for the carrier of the fastener band and fastener strip.

Within the framework of the known measures, the fastener bands and the fastener strips are attached to the diaper by means of an adhesive that is applied to the back of the carrier. Attachment takes place on the outer skin of the diaper, or on a component that is configured as a diaper ear, for example (DE 199 40 185 A1). Handling of materials provided with an adhesive makes great demands on processing. In particular, it must be assured that the adhesive parts are either covered with release films during processing, or only come into contact with other materials, with the adhesive side, at the desired point in time. Because of these problems, it is proposed in DE 199 52 417 A1 to coat the strips with a parting layer that contains silicone, on the side of the fastener elements, which layer must be cured after coating. This method is complicated.

From DE 197 03 557 A1, it is known to attach fastener strips to the outside of a baby diaper using ultrasound bonding. As another possibility for the production of mechanical bonds, bonding by means of heat and/or pressure can be considered (EP 0 877 589 B1). Ultrasound bonding as well as bonding by means of heat and pressure are relatively slow attachment methods. The required dwell time for the production of a firm bond is clearly longer than the time required for contact gluing. Attachment of a strip

forming a reusable fastener to baby diapers by means of heat and pressure therefore appears not to be very suitable for practice, and has not been able to establish itself.

The invention is based on the task of simplifying the attachment of the fastener bands and fastener strips on the baby diaper. The method is supposed to be able to be integrated into the diaper production, and is not allowed to impair the production speed of the diaper production.

This task is accomplished, according to the invention, in the case of the method described initially, in that the strips are basted on in a first method step, by means of thermobonding or ultrasound bonding, and firmly bonded to the counter-surface in a second method step, by means of cold pressing or ultrasound bonding. The two method steps are carried out in spatially separate workstations.

In the case of thermobonding, bonding of the materials takes place using hot tools. In the case of ultrasound bonding, stamping dies that oscillate at high frequency are used, which produce friction heat. By means of local melting and flow processes, the materials to be bonded are merely fixed in place in a first method step. In a second method step, in a spatially separate workstation, the materials are subsequently firmly bonded by means of cold pressing or ultrasound bonding. In a continuous diaper production, the two

method steps can be carried out at the same time, in the separate workstations. By dividing the attachment method into two method steps, the dwell time that is required for applying and attaching the fastener strips and fastener bands in the case of a continuous diaper production can be reduced by up to 50%.

According to a preferred embodiment of the invention, the strips are cut from a material web, with a cut transverse to the web running direction, and passed to the first workstation by means of a transfer device, in which the strips are applied to a web from which the diapers or parts of the diapers are produced, and basted on by means of thermobonding or ultrasound bonding. A rotating transfer device can be used, in particular, as the transfer device, which passes the strips to the workstation with a rotational movement in the same direction as the running direction of the web. Afterwards, the web is passed through the second workstation, in which the strips are firmly bonded to the web.

Using the method according to the invention, bonds between strips and diapers can be produced, which consist of attachment points disposed densely next to one another.

In the following, the invention will be explained using a drawing that presents an exemplary embodiment merely as an example. The drawing schematically shows:

Fig. 1 a method for affixing a reusable fastener that consists of a fastener tape and a fastener strip to a baby diaper,

Fig. 2 the method product produced according to the method described.

In the case of the method shown in Fig. 1, strips 1 are cut from a material web 2, with a cut crosswise to the running direction of the web, and passed to a first workstation 4 by means of a rotating transfer device 3. The strips 1 cut from the material web 2 consist of a carrier and a material laminated on, having fastener elements in the form of loops or hooks. In the first workstation 4, they are applied to a web 5 from which diapers or parts of diapers are produced, and basted on by means of thermobonding or ultrasound bonding. The bond produced in the first workstation 4 merely serves to fix the strips 1 in place on a surface that forms the outside of the diaper. Afterwards, the web is passed through a second workstation 6, in which the strips 1 are firmly bonded to the web 5 by means of cold pressing or ultrasound bonding. In the exemplary embodiment, a station for pressing is represented.

The method product produced according to the method described is shown in Fig. 2. Figure 2 schematically shows a detail of a baby diaper having a lateral fastener band 7, which is attached to a

connection region of the diaper configured as a diaper ear 8, and works together with a fastener strip disposed on the outside of the diaper, not shown in the figure, as a hook-and-loop fastener. The fastener band 7 consists of a carrier and a material laminated on, having hook-shaped fastener elements that work together with loop-shaped fastener elements of the fastener strip attached to the outside of the diaper. The material that is laminated on can be produced by means of textile technology.

The carrier of the fastener band can consist of a single-layer or multi-layer film, a textile material, e.g. nonwoven or knitted fabric, or a laminate of a carrier film and a textile material laminated on, on one or both sides. The carrier can have regions having differing elasticity in the longitudinal direction of the strip. Preferably, the connection region of the carrier that is used for attaching the carrier to the baby diaper is configured as a low-stretch region.

The bond between strip and diaper that is produced according to the method described above consists of attachment points 9 disposed densely next to one another, which were produced by means of local melting and/or flow processes, with the application of pressure.

The fastener strip that consists of a carrier and a material laminated on, having female fastener elements in the form of

loops, is also attached to the outside skin of the diaper without adhesive, in the manner described, whereby the fastener strip is only basted on, in a first method step, by means of thermobonding or ultrasound bonding, and is then firmly bonded to the counter-surface in a second method step, by means of cold pressing or ultrasound bonding.